Attorney's Docket No. 101215-350

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant	:	Andreas PEIN
Application No.	:	10/561,725
Filed	:	March 8, 2007
For	:	WATER-JET DEVICE FOR SEPARATING A BIOLOGICAL STRUCTURE
Group Art Unit	:	3731
Examiner	:	Jonathan Wade Miles

Mail Stop AMENDMENT
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

REPLY TO OFFICE ACTION UNDER § 1.111

Sir:

In response to the Office Action mailed November 08, 2010, please amend the above-identified application as follows:

Amendments to the Claims are reflected in the listings of claims which begin on page 2 of this paper.

Remarks/Arguments begin on page 5 of this paper.

In the Claims:

Claims 1-7 (canceled)

8. (currently amended) A water jet apparatus for severing a biological structure with a jet of severing liquid comprising water, the water jet apparatus comprising

a storage container for the severing liquid,

a piston-cylinder unit comprising

a generally cylindrical opening [[is]] formed in a casing having a wall and a bottom,

a piston received in the cylindrical opening for reciprocal motion of the piston in the cylindrical opening with space remaining adjacent to the bottom of the cylindrical opening, the space functioning as a pressure space upon downstroke of the piston and as a suction space upon upstroke of the piston, and

opposite the bottom formed by the cylindrical opening, the cylindrical opening takes on a conical portion,

an annular membrane having an inner periphery and an outer periphery, the outer periphery attached to the conical portion of the generally cylindrical wall at a position in an upper zone of the piston-cylinder unit and

~~wherein~~

an inner periphery attached to the piston at a position in the upper zone of the piston-cylinder unit,

the upper zone being defined by an annular space above the suction-pressured space, the membrane sealing interior of the piston-cylinder unit below the membrane from exposure to the ambient outside the piston-cylinder unit and

the membrane being dimensioned so as to allow reciprocation of the cylinder and

the annular space being dimensioned so as to allow movement of the membrane therein as the piston reciprocates and to accommodate the membrane when the piston is at rest at the end of ~~a~~ downstroke,

a manipulable operating device including an internal pressure tubule terminating in the jet,

a suction line for conducting the severing liquid from the storage container to the suction-pressure space in the cylinder,

a pressure line for conducting the severing liquid from the suction-pressure space in the cylinder to the operating device, and

a coupling for attaching the eccentric drive to and detaching the eccentric drive from the piston,

the piston-cylinder unit together with the suction line, the pressure line and the operating device constituting a sub-assembly, wherein the suction line is attachable to and detachable from the storage container and the cylinder casing by means of a first and a second coupling and the pressure line is attachable and detachable from the manipulable operating device by a third coupling.

9. (previously presented) The water jet apparatus according to claim 8, wherein at least a lowermost portion of the conical portion tapers inwardly in a downward direction toward the suction-pressured space.

10. (previously presented) The water jet apparatus according to claim 8, wherein the cylinder casing and the piston are constituted of plastic.

11. (previously presented) The water jet apparatus according to claim 8, further comprising a protruding sealing lip formed on the cylinder.

12. (previously presented) The water jet apparatus according to claim 8, further comprising

a connecting device installed in the cylinder for connecting the pressure tube to the suction-pressure space,

a first opening through the cylinder casing,

the connecting device comprising a pressure sleeve press fit into the first opening through the cylinder casing for effecting communication of the pressure line with the suction-pressure space, a pressure tubule concentrically received in the pressure sleeve and having external ribs spaced from an interior wall of the pressure sleeve by a distance corresponding to thickness of a wall of the pressure line, the wall of the pressure line at an end portion of the pressure line being gripped between the ribs of the pressure tubule and the interior wall of the sleeve.

13. (previously presented) The water jet apparatus according to claim 12, further comprising

a second opening through the cylinder casing, the second opening effecting communication of the suction line with the suction-pressured space, the first and second opening being radially oriented and diametrically opposed with respect to the cylinder whereby the connecting device is installable in the first opening by initial insertion thereof through the second opening.

14 (previously presented) The water jet apparatus according to claim 8, wherein the suction pipe of the manipulable operating device is connected via an exhaust line to a pump.

REMARKS/ARGUMENTS

This is in response to the official action dated November 08, 2010. Reconsideration is respectfully requested.

Claim Objections:

The Examiner objected to claim 8 because of the following informalities: "a generally cylindrical opening is formed in a casing" in line 5 should read " a generally cylindrical opening formed in a casing," and "wherein" should be omitted from line 15, and "when the piston is at rest at end of a downstroke" in lines 23-24 should read "when the piston is at rest at the end of downstroke." All instances have been addresses and have been amended accordingly. Thus, the claim objections have been overcome.

Claim rejections under 35 USC § 103

The Examiner rejected claims 8, 9, 11 and 14 as being unpatentable over Yoder (US 5,871,462) in view of McDonnell (US 5,591,184) and Pelmulder et al. (US 4818190).

Applicant amended independent claim 8 to more precisely define the invention, which differs from Yoder is so many ways that a person of ordinary skill in the art would not combine the references as suggested by the Examiner with Yoder and come up with applicants invention. Claims 8 claims a different water jet apparatus than the one utilized in the method of water cutting described by Yoder.

Some distinguishing elements of claim 8 will be discussed in detail below. Yoder teaches away from Applicant's invention as will be shown below. Yoder's teachings, combined with any teachings of the secondary references cited, do not render obvious applicant's invention. Before discussing the fundamental differences, Applicant respectfully requests that the Examiner should keep in mind that Yoder discloses basically a *disposable* /reusable pump body in conjunction with a *disposable pump cartridge*. The reason for this set up is that in Yoder, the pump handles the working fluid directly in the cylindrical piston chamber 64 and thus, the disposable pump cartridge which is mounted on top of the cylindrical chamber is in *constant contact with the diaphragm 86* of the disposable pump cartridge 28. Such set up require frequent maintenance

due to contamination and thus, the diaphragm pump is *disclosed only as a disposable pump cartridge.*

Yoder therefore teaches a pump which is entirely opposite of the pump used in Applicant's invention. Here, Applicant provides a piston pump with a casing having a generally cylindrical opening and a portion which is shaped conically. A membrane is held in the *conical space* ("parked position") in which the membrane moves along with the piston's up and down strokes. At no time during such up and down movement does the membrane contact the working fluid. A sealing ring 23 holds any fluid from entering the piston-cylindrical casing space and thus, the membrane 26 never contacts the fluid. Because the membrane remains its "fundamental shape and as a result the sealing function remain maintained over a long storage period which often equals to several months and years. And so, the water jet device becomes more reliably in operation" [Specification, page 5 line 15-page 6 line 2]. Accordingly, Applicant teaches a set up which is reliable and stable over time and Yoder provides a set up designed to easily replace the disposable pump parts due to contamination. These requirements are manifested in entirely different pump designs and requirements.

Applicant claims in independent claim 8 limitations that are nowhere found in Yoder. Nowhere in Yoder does the cylindrical chamber take on a **"conical portion", nowhere** does his "membrane" (diaphragm 86) have an "**inner periphery and an outer periphery, the outer periphery attached to the conical portion of the generally cylindrical wall at a position in an upper zone of the piston-cylinder unit and the inner periphery attached to the piston at a position in the upper zone of the piston-cylinder unit".** Nowhere does Yoder have an "**upper zone being defined by an annular space above the suction-pressured space,** the membrane sealing interior of the piston-cylinder unit below the membrane from exposure to the ambient outside the piston-cylinder unit" and "the membrane being dimensioned so as to allow reciprocation of the cylinder" and "the **annular space being dimensioned so as to allow movement of the membrane therein as the piston reciprocates and to accommodate the membrane when the piston is at rest at the end of downstroke**".

The Examiner combined Yoder and Pelmulder. Applicant submits that the combination does not render the claims obvious. Applicant showed (above) that Yoder provides an entirely different pump and having an entirely different objective in mind compared to that of Applicant. Whereas Applicant has no need for providing "sterilization for the device" (office action page 5) due to its design in which the membrane 24 never comes into contact of the working fluids, Applicant can not see how a person skilled in the art would be motivated to look at Yoder and Pelmulder and, according to the Examiner, learn about a sterilization system, which is entirely an unnecessary for Applicant. The Examiner cites from Pelmulder, Col. 10, lines 14-17and Col. 18, lines 29-35. However, these two sections refer to entirely different parts of Pelmulder infusion system. Col. 10, lines 14-17 is part of the description of Figs. 1-8 showing a disposable cassette, including "seven components". It does show a main cylinder bore 114 the bottom of which is "tapered to facilitate the entry of the piston." (Col. 10, lines 18-19). However, it is not clear to Applicant how this conical area, designed to accept the piston, renders obvious (in combination with Yoder) Applicant's conical area which houses a membrane. Applicant's conical area is claimed to be in the "upper zone of the piston-cylinder unit", and "the upper zone being defined by an annular space above the suction-pressured space". Thus, the conical space in Pelmulder serves an entirely different purpose and is not at all suitable to accommodate a membrane, as Applicant's tapered area does ("annular parked position space" (25)). Further, Pelmulder does not have any features that would allow a membrane to be affixed in the conical space the way Applicant claims. Applicant claims "an annular membrane having an inner periphery and an outer periphery, the outer periphery attached to the conical portion of the generally cylindrical wall at a position in an upper zone of the piston-cylinder unit" and "an inner periphery attached to the piston at a position in the upper zone of the piston-cylinder unit". These limitations hardly apply to the boot seal 269 of the piston cap of Pelmulder as combined with Yoder. Again, there is no motivation to combine these references in order to provide sterilization, because applicant has no need for sterilization, but instead shields the membrane from contamination by design of the piston with cylinder casing and providing a "parked position space". Thus, claim 8 should be allowable.

Claims 9, 11 and 14 are dependent directly from claim 8. These claims should be allowable for

the same reasons as claim 8 should be allowable.

The Examiner rejected claim 10 as being unpatentable over Yoder (US 5,871,462) in view of McDonnell (US 5,591,184) and Pelmulder et al. (US 4818190) and further in view of Allen (US 3622251). Claim 10 depends on claim 8 and further limits the claim. Claim 10 therefore includes all limitations of claim 8. Claim 10 should be allowable for the same reasons as claim 8.

The Examiner rejected claims 12 and 13 as being unpatentable over Yoder (US 5,871,462) in view of McDonnell (US 5,591,184) and Pelmulder et al. (US 4818190) and in view of Rogers (US 4551146). Claims 12 and 13 are directly or indirectly depended on claim 8 and therefore include all limitations of claim 8. Claims 12 and 13 should be allowable for the same reasons as claim 8.

Allowance of all claims is respectfully requested.

CONDITIONAL PETITION FOR EXTENSION OF TIME

If entry and consideration of the amendments above requires an extension of time, Applicants respectfully request that this be considered a petition therefor. The Assistant Commissioner is authorized to charge any fee(s) due in this connection to Deposit Account No. 14-1263.

ADDITIONAL FEE

Please charge any insufficiency of fees, or credit any excess, to Deposit Account No. 14-1263.

Respectfully submitted,
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